Add the following new claim 36.

-- 36. The composite of claim 1 in which the body layer defines a height and the thickness of the cover layer is less than the height of the body layer. --

REMARKS

Claim 1 is amended consistently with the disclosure on page 4, line 4. Claims 1, 6-8, 30, and 33 have also been amended as to form to clarify the defining concepts (i) that the cover layer is characterized by a thickness dimension, (ii) that the thickness dimension of the cover layer is uniform for the whole cover layer, and (iii) that the cover layer penetrates into the body layer a distance smaller than the thickness dimension. These parameters are disclosed throughout the specification such as on page 5, lines 15-17, page 6, lines 6-9, and lines 12-15, and in Figs. 2A and 2B. New claim 36 is supported by Figs. 2A and 2B. No new matter is added.

A copy of the amended claims showing the changes from the previous version is submitted herewith on a separate sheet.

Rejections Under 35 U.S.C. §103

I. Goppel et al. US 3,915,783

Claims 1-10 and 29, 31, 33 and 35 stand rejected as being obvious over Goppel et al. US 3,915,783 ("Goppel"). The basis for rejection is substantially as previously stated. Goppel is said to describe all the limitations called for by the claims except for the uniform thickness dimension of the cover layer. It is alleged that selecting a uniform cover layer thickness constitutes a mere change in size of a component, which being within the level of ordinary skill in the art, renders the claimed invention obvious. In addition, the office action points to three specific teachings of Goppel, namely, (a) that the thickness [of the laminate] can be altered, (b) that the sheet can be properly impregnated, and (c) that the sheet should

contain sufficient resin to impregnate adequately. This rejection is respectfully traversed on the following grounds.

Goppel describes an article of at least two layers laminated with a thermosetting resin. One layer is a fibrous reinforcing material. The other required layer is an open cell structure sheet. The sheet is impregnated with resin and the reinforcing layer is applied to one side of the impregnated sheet. Then the two layers are compressed to the extent that the open cell sheet is less than 30% of original thickness so as to expel resin from the sheet into the reinforcing layer. The reinforcing layer is impregnated with resin <u>through its thickness</u> and then cured while in the compressed condition. This produces a fibrous layer <u>uniformly impregnated</u> with thermosetting resin and a dense, visually solid layer without voids in which the fibrous layer is bound to the dense, solid layer by the thermosetting resin. See col. 2, lines 13-44.

At an Office interview on July 16, 2002, Applicant's attorney explained the aspects of the invention that are novel relative to Goppel. Although the claims were clear, Applicant has now amended the claims to further clarify the defining structure of the composite. In particular, these amendments seek primarily to eliminate any confusion between the thickness of the cover layer, the depth of penetration of the cover layer into the body layer, and the uniformity of the cover layer thickness. Thus it should now be more easily seen that the claimed invention is different and non-obvious over the references.

In contrast to the structure of Goppel, claim 1 calls for a composite of a porous body layer and a solid cover layer. By the present amendment this claim explicitly recites that the body layer is porous. Moreover, the cover layer has a characteristic thickness dimension, i.e., a dimension in the thickness direction of the cover layer. This dimensional parameter of the cover layer is substantially uniform. That is, the thickness of the

cover layer is about the same everywhere on the composite. By way of example, if the thickness dimension of the cover layer is 0.5 μm, the cover layer will be about 0.5 μm thick everywhere on the face of the composite. For sake of brevity, it is pointed out that the issue of indefiniteness of the term "substantially uniform" has already been raised by the Examiner and answered in previous responses by Applicant. No section 112 indefiniteness objections are now pending, hence Applicant understands that this issue has been settled.

Claim 1 further calls for the cover layer to extend into the body layer from the roughly textured face to a depth less than the thickness dimension of the cover layer. This embedding buries the roughly textured face of the body layer within the cover layer. Furthermore, as just mentioned, the thickness dimension of the cover layer is substantially uniform throughout the composite. Goppel does not teach or suggest the structure defined by the claim.

To further explain the distinction between Goppel and this invention, attention is directed to the attached sheet of Figs. 1A-1D and 2. Figs. 1A-1D are drawn to represent cross section views of the laminate of Goppel at progressive stages of formation. Applicant submits that the figures reasonably accurately represent the structures described in col. 2, lines 13-44, and in more detail, in col. 3, line 29- col. 5, line 28. Thus, Fig. 1A shows a flexible, compressible open cell sheet.

Fig. 1B shows the open cell sheet after impregnating it with a curable thermosetting resin. The resin is represented by the shaded area. Goppel mentions that there may be voids present after impregnation. See col. 2, lines 22-23. The voids are shown as white spots.

Fig. 1C shows a fibrous reinforcing material applied as a layer on at least one side of the impregnated sheet. At this stage, Goppel calls for compressing the sheet and layer together

to expel resin from the impregnated sheet into the fibrous reinforcing material.

Fig. 1D shows the final compressed composite product. Goppel describes this structure as having a uniformly impregnated fibrous layer and a dense, visually solid, void-free sheet compressed to less than 30% of original thickness (not to scale in attached drawing).

In comparison, Fig. 2 is a cross section view representing the structure provided by the instant invention. The body layer is seen to be a porous web of material that defines a roughly textured face. In the illustration, fiber ends at the surface of the body layer are circled to show the rough texture. A cover layer, is represented by shaded area. The cover layer is embedded into the body layer. The cover layer has a uniform thickness. The cover layer penetrates into the body layer to a distance less than the thickness dimension of the cover layer. Consequently, there is some cured resin above the textured face.

Also note that a portion of the body layer underlying the cover layer remains porous. This structure is defined by the relationship between the thickness of the cover layer and the height of the body layer. It is the subject matter of new claim 36.

Comparison of attached Figs. 1A-1D to Fig. 2, shows that Goppel describes a completely different laminated structure. More specifically, Goppel discloses a fully resin-impregnated, void-free laminate of a compressed fibrous reinforcement layer and compressed cellular sheet. The resin extends through the whole thickness of the laminate. In contrast, the cover layer of the claimed invention penetrates only to a distance that is less than the thickness of the cover layer. Additionally, Goppel's laminate is solid and void-free. The claimed composite, however, has a porous body layer (claim 1) and the cover layer, that is, the solid part of the composite, is thinner than the height of

the body layer (claim 36). Therefore, some of the body layer, namely, the portion not penetrated by the cover layer (attached Fig. 2), is porous in the claimed composite. Goppel does not teach or suggest these features.

The Examiner observes that claim 1 is an open form claim in that it utilizes the transition term "comprising". Applicant acknowledges that an open form claim reads upon a structure having elements defined by all of the claim limitations plus other extraneous elements. However, Goppel does not render obvious claim 1 and other open form claims of this application merely because the claims are open form. For the claims to be obvious, at least all of the limitations of the claims must be taught or suggested by the prior art.

As explained above, Goppel's structure does not have all the attributes defined by the claims. For example, the Examiner cited the following text from Goppel col. 2, lines 32-33

> 2. at least one fibrous layer which is uniformly impregnated with a thermosetting resin.

Although this disclosure teaches that a fibrous layers can be uniformly impregnated with resin, it says nothing about the thicknesses involve. Claim 1 states that the cover layer penetrates part way into the body layer but not fully. Claim 36 calls for the body layer to be thicker than the cover layer. Because the body layer is porous, part of the claimed composite is not impregnated, that is the portion underlying the cover layer. See attached Fig. 2. Even though Goppel discloses more structure than the above quoted text, it does not make the claims unpatentable. It does not teach or suggest all of the claim limitations.

Applicant further points out that while claim 1 and dependent claims are open form, claim 30 is in closed form. To

make this claim unpatentable, the prior art must teach or suggest exactly all of the claim limitations. Goppel does not do this.

The office action mentions several factors in the paragraph bridging pages 2 and 3. These factors are asserted to be important to basis for rejection. However, the recitation does not articulate the relevance of these factors to specific structural elements of the claimed invention. Applicant respectfully submits that in present form these factors do not support a prima facie case of obviousness.

II. Goppel in view of Schakel et al., US 5,567,504:

Claims 30, 32 and 34 stand rejected as being obvious over Goppel in view of Schakel et al., US 5,567,504 ("Schakel"). This rejection is respectfully traversed as follows.

The office action is deemed to maintain that Goppel fully describes the limitations of the rejected claims except with regard to coating the cover layer. Schakel is provided for describing a glass fiber board coated with polymeric latex to a predetermined thickness.

The office action recites that one of ordinary skill would be motivated to employ the coating polymeric latex of Schakel for the coating resin of Goppel "with the expectation that the thickness of the coating penetration would be determined by the amount of tough surface skin on the surface." Schakel is concerned with applying a layer of polymeric coating material over the grooves cut into glass fiber boards for insulating air ducts. This prevents erosion of the fibers from the surface of the grooves by high velocity air passing through the ducts. (Col. 1, lines 50-52)

Repeatedly, Schakel refers to the method as distributing the coating <u>over</u> the surface of the grooves. See col. 4, lines 9-10, 26, and 32. Also, Schakel Figs. 2 and 3 clearly show the coating on top of the duct board. There is no penetration mentioned.

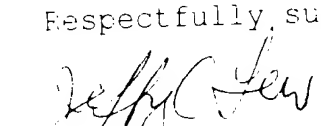
Goppel relates to a laminate formed by expressing the laminating resin from an impregnated open cell sheet into an adjacent fiber reinforcement layer by compressing the sheet and layer together. There is no mention of a coating of uniform thickness on a fibrous layer.

In holding an invention obvious in view of a combination of references, there must be some suggestion, motivation, or teaching in the prior art that would have led a person of ordinary skill in the art to select the references and combine them in the way that would produce the claimed invention. The two references have mutually exclusive interests. Schakel involves coating on top of a surface only and Goppel involves impregnation within a layer. There is no reason emanating from the prior art for combining the references in the manner that the office action states. Applicant urges that the rejection should be withdrawn for failure of motivation to combine the references.

Additionally, the claims call for composites having specifically identified components. For example, claim 30 calls for a composite consisting of a body layer and a solid cover layer that penetrates into the body. Goppel describes a three layer laminate that includes the sheet, the fibrous reinforcing material layer and the resin. Schakel describes a fibrous duct board covered on its surface with a polymeric latex coating. Even if the references are combined, the office action does not present how the combination teaches or suggests the present invention.

For the foregoing reasons, Applicant respectfully asks that the rejections be withdrawn and the pending claims be allowed.

Respectfully submitted,



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The amended claims showing the changes from the previous version are as follows:

Claim 1. (Twice amended) A composite comprising

(a) at least one body layer of a porous web having a roughly textured face and

(b) a cover layer of a solid of a cured liquid cast on the roughly textured face,

in which the cover layer has a thickness dimension which is substantially uniform [thickness] and

in which the cover layer is permanently embedded into the body layer from the roughly textured face to a depth less than the thickness dimension.

Claim 6. (Amended) The composite of claim 1 in which the [uniform] thickness dimension is in the range of about 0.01 to 1 mm.

Claim 7. (Twice amended) The composite of claim 6 in which the thickness dimension of the cover layer has a variation of at most 1 mm.

Claim 8. (Amended) The composite of claim 6 in which the cover layer extends into the body layer to a distance from the roughly textured face [is embedded to a depth of] at most about 95% of the [uniform] thickness dimension.

Claim 30. (Twice amended) The composite of claim 1 which consists of

(a) a body layer consisting essentially of glass fibers defining a face of the body layer, and

(b) a cover layer embedded into the face of the body layer, the cover layer consisting of a solid substance having a thickness dimension,

in which the thickness dimension is substantially uniform throughout the cover layer and in which composite the cover layer penetrates into the body layer to a distance of less than the thickness dimension of the cover layer.

Claim 33. (Amended) The composite of claim 30 in which the thickness dimension of the cover layer at any location on the composite differs from the thickness dimension of the cover layer at all other locations on the composite by at most about 1 mm.